

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC. 20554**

<b>In the Matter of</b>	)	
	)	
<b>Amendment of Part 97 of</b>	)	<b>RM-10811</b>
<b>the Commission's Rules to Revise</b>	)	
<b>Examination Requirements and</b>	)	
<b>Improve Testing Standards</b>	)	
	)	

**To: The Commission**

**COMMENTS of Nickolaus E. Leggett  
N3NL Amateur Radio Operator**

The following is a set of comments from Nickolaus E. Leggett, an amateur radio operator (Extra Class licensee – call sign N3NL), inventor (U.S. Patents # 3,280,929 and 3,280,930 and one electronics invention patent application pending), and a certified electronics technician (ISCET and NARTE). I also have a Master of Arts degree in Political Science from the Johns Hopkins University (May 1970).

My comments are in response to the petition filed by the FISTS amateur radio organization.

**Morse Code and Electronics Experimentation**

FISTS makes the important point that Morse Code facilitates amateur radio operators' involvement with the design, analysis, and construction of electronic circuits. (Refer to items 11 [page 6], 16, 17, and 18 [page 7] of the FISTS petition) The basic Morse Code transmitter is a very simple radio-frequency "light bulb" that is turned on and off with a Morse Code key. When I first got on the air as a beginner with the Novice Class call sign WN2UEQ, I operated a one-tube transmitter. This one-tube transmitter

operated at 25 Watts input power. The transmitter was so simple that it welcomed beginners, such as me, into learning and studying electronics technology. Also, as a beginner I was able to service this simple station.

This opportunity continues in the present day with the low-power (QRP) Morse Code amateur radio equipment on the market. This equipment is easy to build, service, and to afford.

If we remove Morse Code from the license examinations many hams will not be motivated to learn the code and they will miss out on an excellent opportunity to learn hands-on electronics. If the Commission does decide to completely eliminate any Morse Code testing, the Commission should take steps to facilitate beginners' use of basic amplitude modulation (AM) transmitters. One way or another, beginners must have the opportunity to work with the electronics technology of simple transmitters and receivers.

In addition, FISTS demonstrates that some advanced technologies are well suited for Morse Code operation.

### **Morse Code and Intense Disasters**

It is clear that intense disasters, or megadisasters, can occur. These disasters can be large-scale natural events or intentional actions by terrorists or rogue nations. During such an event an amateur radio operator can easily be isolated where he or she has to improvise radio communications from resources at hand. For example, a ham could be isolated in a building by a terrorist action that renders the outside environment toxic.

In this type of situation, radio operators who can improvise equipment serve the public interest. The fact of the matter is that with Morse Code you can “talk” using almost anything that can be turned on and off. For example, you can feed a spark to a

length of wire to create a broadband noise source similar to the 1920s spark gap transmitters. Key this source and you have a means for communication that does not require any resonant circuits at all. I know that this works, because I have done it myself years ago.

In addition, the isolated ham with Morse Code knowledge can use a light, whistle, car horn, boat horn, or any other source of noise for local communication.

In addition, damaged radio equipment can be used by merely keying the carrier without need to repair the modulation system.

We need amateur radio operators with knowledge of Morse Code and hands-on electronics to accomplish this type of emergency improvisation. These events are not common, but when they do occur we need the skills in place to get the job done. Morse Code is part of this vital skill set.

### **Technical Requirements for Amateur Radio Operator Licenses**

The FISTS petition discusses the issue of amateur radio electronics knowledge testing. They state that they do not want amateur radio operators to become merely non-technical consumers of electronics technology. (Refer to item 33 on page 10 of their petition.)

This is an ongoing issue of the conflicting values of open access versus technical excellence. In the past, this conflict was managed by having a hierarchy of amateur radio licenses ranging from the easy-to-get Novice Class license to the wickedly hard Amateur Extra Class license.

This balance can be restored by taking the steps of establishing the Extra Class license as a very difficult exam in electronics (including circuit analysis) with a

requirement to know Morse Code at a speed of at least 5 words-per-minute. The middle level license could be the General Class at a similar level as today. The beginner license could be the Technician Class with some Morse Code (automated and manual) and digital data privileges on the short-wave (high frequency) amateur bands.

With such a hierarchy, the beginner is motivated to advance his or her skills over time. This system could be established without any major additional costs or labor by Commission personnel.

### **Circuit Knowledge**

At some level in the amateur radio licensing system, there should be examinations that test for knowledge about electronic circuits and the interconnection of individual components into working devices. One must understand circuits in order to understand electronics. The Extra Class license should include questions that evaluate specific circuit schematic diagrams.

### **Recommended Actions**

The Commission should seriously consider the FISTS petition. It is clear that Morse Code testing has a constructive contribution to 21<sup>st</sup> Century amateur radio.

**Respectfully submitted,**

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